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DRAFT GUIDELINES ON KEY SECTORS FOR TRADE EFFICIENCY

TELECOMMUNICATIONS

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on the basis of a study by consultants*

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Synopsis

1. This contribution puts into perspective the role played by telecommunications in efforts to achieve greater efficiency in international trade. Given the impact that television infrastructures, networks and services can and should have on the efficiency of markets for goods and services, any obstacle at this level can prove harmful.

2. This report sets out to identify:

The contribution of telecommunications to international trade efficiency;

The short- and medium-term bottlenecks;

The short-, medium- and long-term solutions.

3. International trade has to develop in the light of both the globalization and the increasing interlinkage of economies. There are still those today who are left on the fringes of international trading (developing countries, economies in transition, small and medium-sized enterprises). If they are to be integrated once and for all into this process, in which the circulation of information plays a key role, networks have to be established.

4. Telecommunications have to be regarded as a key resource for international trade in goods and services. The international community has, moreover, recognized this quite clearly. Like any resource, telecommunications are rather scarce and can be used to better or worse effect. Properly dimensioned (in terms of its nature, volume and price), the telecommunications resource can improve the flow of international trade. Properly used (in terms of cost and applications), it can increase the value added of the trading activity beyond the transaction itself.

5. There is today an unprecedented opportunity to base the development of international trade on intensive use of efficient telecommunications. The dimensioning of this resource, however, at present raises a twofold problem: unequal access to the basic service, the telephone, and unequal access to advanced services. As regards its use, there are several dangers to be avoided: under-use by users, the perverse effects of competition between suppliers of services which limits customers' choice and distortions due to the behaviour of Governments.

6. The most urgent remedies involve making available a truly universal service while facilitating access to certain services more suited to the needs of international trade. Structural action ought to be undertaken forthwith, with due regard for certain economic requirements relating to the supply of services and for educational requirements relating to their use. What this amounts to is a policy of extending the network and developing uses.

7. UNCTAD's "trade efficiency" initiative offers an opportunity to mobilize telecommunication operators and to evaluate in specific terms the capacity of telecommunication services to meet the economic aims it sets.

I. Telecommunications: a key resource for international trade

8. Concerning the role that telecommunications can play as part of efforts to achieve greater efficiency in an expanding international trade system, we may start from a recognition of the following facts:

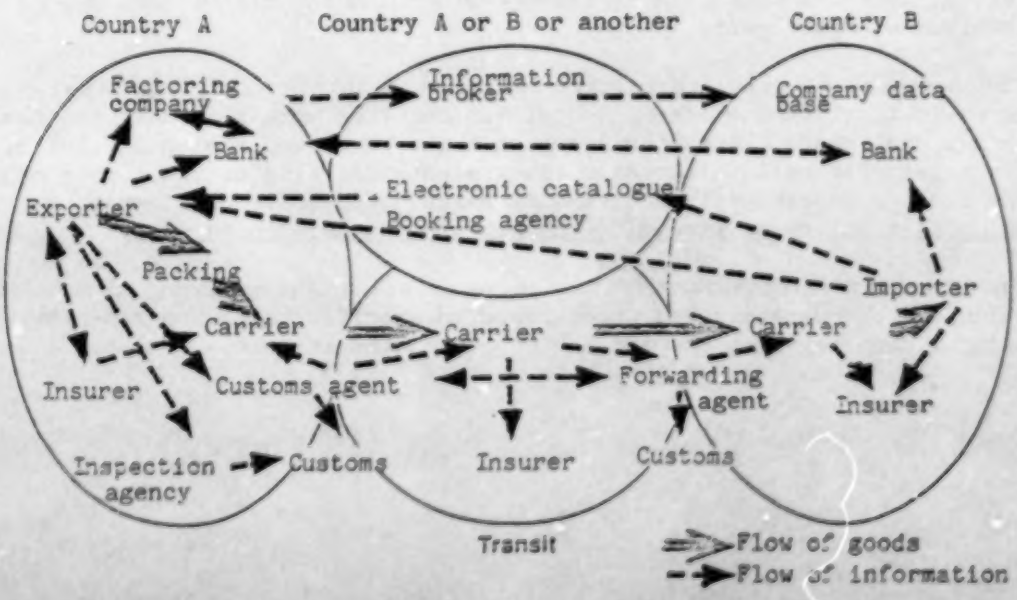
> Telecommunications are today an important factor in gaining access to and expanding markets, particularly at the international level: those who cannot gain access to good networks and services will be more and more excluded from international markets;
>
> Telecommunications are essential today for the supply of commercial services regarded as normal in more and more markets: those who do not know how to utilize them will soon become uncompetitive.

9. Telecommunication infrastructure, network and services thus constitute, from the standpoint of the development of world trade, an essential economic resource and, more and more, a necessary condition for entering and competing on international markets.

10. Any production process today entails the mobilization of large amounts of information. Any commercial transaction similarly requires the circulation of many items of information. The product sold, whether goods or services, contains added value in the form of information which is growing from year to year. OECD calculates that in developed economies between 40 and 60 per cent of the labour force is employed in producing, processing or communicating information. The figure is over 30 per cent in many developing economies.

11. The following diagram illustrates, with reference to international trade, the variety of participants involved in the commercial chain, many of whom see nothing but information pass through their hands: the flows of information involve many more correspondents than the flows of goods, and the network of communications between the parties involved in a transaction today reaches a high level of complexity.

The trade chain: predominance of flows of information



A. The infrastructure of economic activity

12. There is no country in the world today that does not consider it essential to develop its communication infrastructures. While the 1960s and 1970s established the importance of developing transport and energy infrastructures for the harmonious development of developing countries, the 1980s showed that the development of many sectors of economic activity could no longer be envisaged without consistent development of telecommunication networks.

13. The Maitland Commission's report entitled "The Missing Link", published by the International Telecommunication Union (ITU) nearly 10 years ago, emphasized the difficulties caused by underdevelopment of telecommunication infrastructures. This fact, which is demonstrated daily in the developed countries, where any interruption of telecommunication services leads immediately to substantial trouble in the economy, can now be confirmed in most developing countries, where the operation both of government offices and of many sectors of activity depends more and more on telecommunication services.

14. The telephone service has become essential in the daily running of many activities. Thanks to the improvement in its capabilities, the automation of networks and the increasing number of terminals that can be connected to one single telephone line, the telephone is today the essential instrument for any economic activity. Its use has grown as economic systems have shortened the time factors in production activities. Production times, like those for the flow of goods, have been cut sharply in the last two decades. To operate in markets which are becoming more and more numerous obliges any enterprise today to work under more and more severe time constraints.

15. Our economies now function on what is known as a "just-in-time" basis, where stocks are reduced to a minimum and there is a more and more evident interaction between the market and production, leading to worldwide modes of production to order. Telecommunications form an essential infrastructure for this new trade efficiency. Thanks to telecommunications, it is becoming possible to increase the radius of the market - nationally, but also internationally. Combined with improved performance on the part of the transport and financial systems, to which they also contribute, the use of telecommunications not only increases trade efficiency, but is actually becoming essential in order to provide the minimum commercial services demanded by markets. Fax, which has supplanted and improved on many functions of telex, cellular radio-telephones and paging are used daily by thousands of people involved in international trade, who find in these services a means of remaining in contact either with their base or with their clients, wherever they may be.

16. Properly dimensioned, telecommunication infrastructures should lead to better organization of markets involved in international trade.

B. The network as medium for an information structure

17. The point made above is particularly relevant in sectors of activity where it is gradually becoming the practice for information relating to a

transaction to be circulated independently of the physical circulation of the goods, and more generally of the assets, to which it relates. Until recently, information on transactions circulated "attached" to goods or assets, mainly on paper. Improvements in trade procedures have made it possible to "detach" this information from the goods in question and to envisage transferring them on the new electronic media developed over the last 15 years. Already the question arises of transmitting them over computer-to-computer telecommunication networks. Such electronic communication (known as EDI - electronic data interchange) brings a substantial improvement in trade efficiency by reducing delays, eliminating sources of error and increasing the possibilities for processing at all points in the information circuits being established.

18. International trade is surely an area that can benefit particularly from the manifold advantages offered by electronic transmission of trade documents. It must be pointed out here that electronic transmission of trade documents, and hence the use of telecommunication networks, requires prior computerization of the documents within each link of the chain. Such computerization will be conditioned by many other factors, including legal and regulatory ones. Computerization of firms' and administrations' internal procedures is sometimes a long and expensive process, often entailing changes in organization. Here the suppliers of efficient telecommunication services can speed up internal computerization by bodies and firms concerned with foreign trade by demonstrating the additional advantages of a computerization strategy. The computerization and networking processes thus strengthen each other as means of generating productivity gains from the mechanisms and procedures governing trade in goods and services at the international level.

19. Properly used, telecommunication networks should help to bring down the costs of commercial transactions.

C. The value-added network of international exchange and trade

20. Facilitation of trade implies optimization of the functional handling of data (collection, presentation, communication and processing). This information has to proceed in parallel with the flows of goods and finance, which, moreover, require that some trace of the dealings between those involved in international trade (merchants, carriers, bankers, insurers, customs, warehouses, distributors, even final customers) remains in existence well beyond the actual time of the transaction.

21. In preparation for the transaction, those concerned have to keep themselves informed about market trends and have to be able to make business contacts before the transaction, with all that implies in terms of relevant information. During the transaction, specific needs for contacts may emerge, not just in the procedural part, but also in the management of "snags". Finally, after the transaction, feedback logic systems can greatly help to make international trade more efficient and dynamic.

22. Telecommunications can constitute the matrix of such a form of economic organization, oriented towards constant gains in efficiency. Applications (audiotex, videotex, teleconference) are already available for the preparatory part of deals in goods and services; EDI, as we have seen, accompanies the

transaction, while the universal telecommunication service remains the basis, with its principle of ubiquity, for maintaining the necessary contacts between the partners to the deal; finally, systems of the smart-network type will improve the flow in space and time, while making it possible to reprocess information which at some time or another has passed through the telecommunication networks.

23. In many cases, large industrial or trading organizations have already introduced extensive use of telecommunication networks and services around the world. Their size, their multinational presence and the diversity and extent of their markets lead them to take the fullest possible advantage of innovations in the world of telecommunications. Even in contexts where the supply of networks and services is limited, they can put into operation efficient private networks on basic infrastructures. Small and medium-sized enterprises, on the other hand, rarely have access to the same services and can thus be at a particular disadvantage as regards access to markets.

24. Properly managed, telecommunication services should increase the value added of the activity of trading in goods and services.

II. Bottlenecks

25. Four categories of problems are encountered by many enterprises in the field of telecommunications. They relate to:

Physical and economic access to the basic service;

Access to value-added networks and services;

Problems relating to the use of telecommunication services;

Distortions introduced by government policies.

A. Inequality in relation to the basic service

26. Today's telephone network acts as the medium for many categories of services. While the technologies used are for the most part electronic, the services offered by telephone networks all over the world are still analogue (telephone, fax, modem data transmission, etc.).

1. Access to the telephone network

27. Access to the telephone network is very unequal from one country to another. While in 1993 the world was served by about 600 million telephone lines for a total population of 5.5 billion, or an average density of 110 lines per 1,000 inhabitants, the average density by country varies considerably: it is still less than 1 line per 1,000 inhabitants in some 10 or so countries, but is over 600 lines per 1,000 inhabitants in the most highly developed countries - a more than 600-fold difference! These great disparities are summarized in the following table:

	Main telephone lines millions	Population billions	Telephone density per 1,000 inhabitants
North America	171.8	375.8	457
South America	28.8	376.9	76
Europe	210.5	576.4	365
EEC	159.3	343.3	464
Asia	167.8	3 489.9	48
Africa	11.4	709.9	16
Oceania	11.1	26.4	420
Total	601.4	5 555.9	108
OECD	418.3	825.5	507

28. There are two aspects of network modernization that have to be distinguished:

(a) The first involves the introduction of a more and more sophisticated electronic network control system (particularly for setting up calls), which makes available a wider range of functions, e.g. call re-routing, detailed billing and mobile telephone hunting;

(b) The second concerns the digitization of information and the ability to establish a digital connection with the heart of the network, enabling data to be transmitted at much higher rates and bringing a very marked improvement in service quality, while opening up the possibility of combining different types of information (voice - pictures - data).

29. Network digitization involves these two aspects and concerns not only the installation of digital switches, but also the introduction of an efficient signalling network (the control network of the network open to users) and in the end digitization of network access.

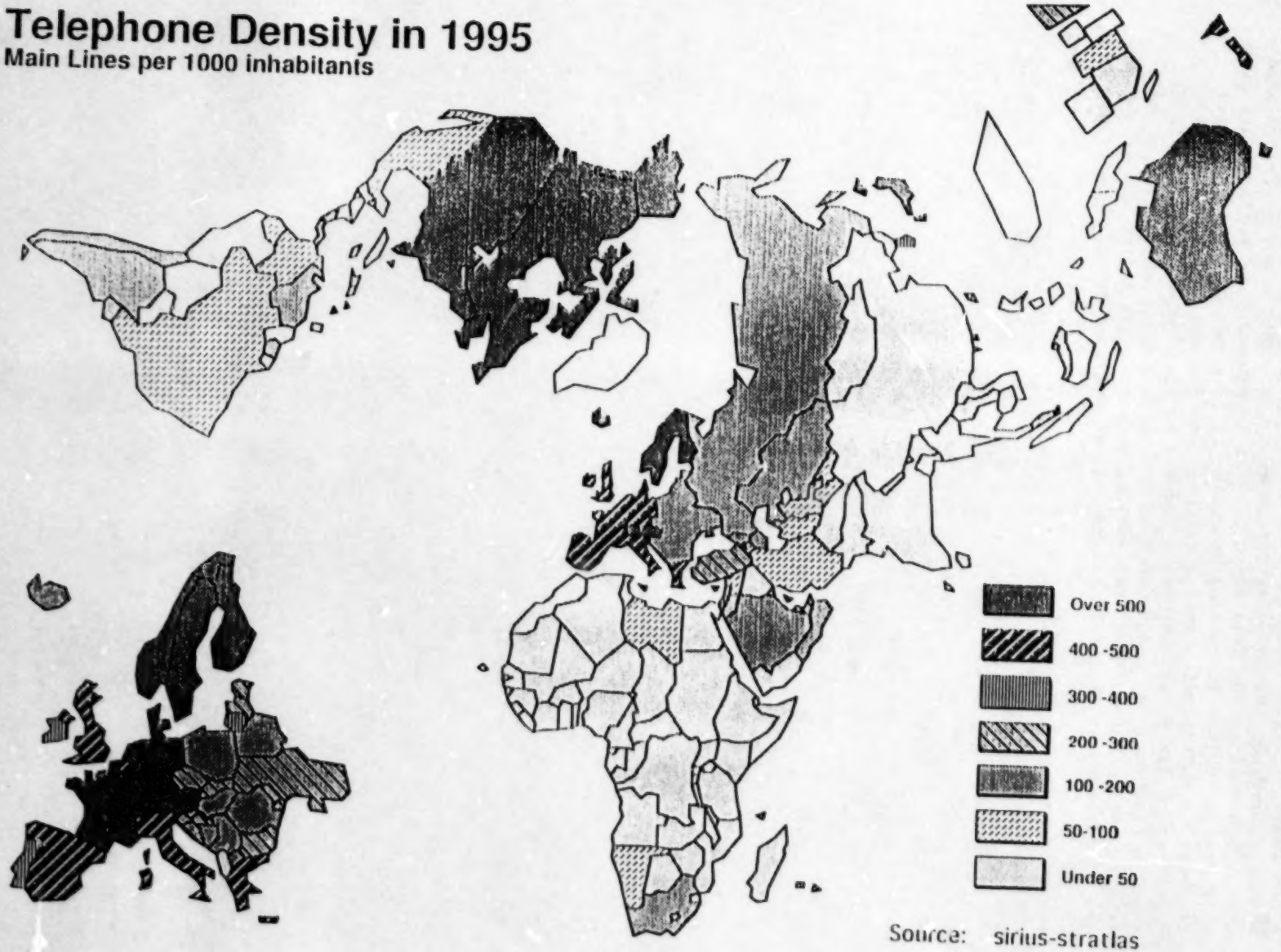
30. Map 1 shows differences in telephone density by country. But density is not the only criterion to be taken into account in analysing unequal access to international networks. Access to international networks may not be combined with connection to national networks. It requires a special subscription procedure, e.g. because there is a separate international operating agency. This subscription, which represents an extra cost, may only be granted on certain conditions with regard to the deposit of security, special collection procedures, and even billing in foreign currencies, which greatly limits access. Map 2 shows the proportion of lines with access to the international service by country.

31. There may be other "physical" barriers limiting the use of telecommunication networks, such as incomplete network automation and a low level of digitization. The fact that many countries still have manually-operated telephone services means that they cannot offer the same quality, nor often the same functions, as an automatic network. Apart from much greater delays in setting up calls, it is often difficult, or even impossible, to transmit faxes correctly. As for the level of network digitization, it determines users' access to advanced services available through electronic exchanges such as call redirection, signalling of call waiting, etc. Map 3 shows the level of network digitization and illustrates the differences in access to the additional services provided by telephone networks.

Map 1

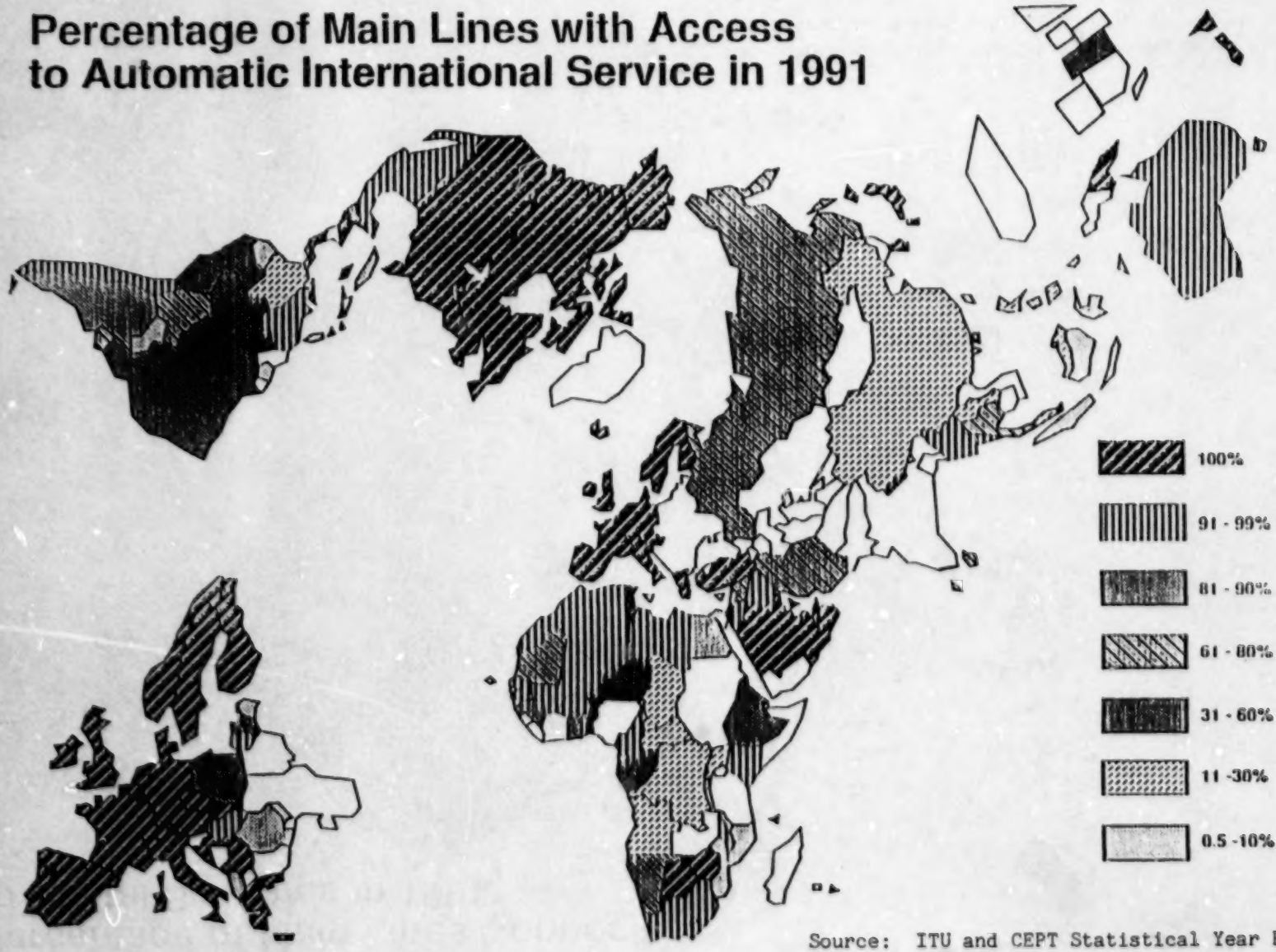
Telephone Density in 1995

Main Lines per 1000 inhabitants



Map 2

Percentage of Main Lines with Access to Automatic International Service in 1991



Source: ITU and CEPT Statistical Year Books, annual reports.

Map 3

Percentage of Main Lines Connected to Digital Switches in 1991*
71-100%
51-70%
31-50%
11-30%
0-10%
Source: ITU Regional Statistics, AT&T Year Book, annual reports
* for North and South America, 1990

2. Economic access to networks

32. Economic access to networks raises two types of questions:

The level of tariffs;

Non-tariff obstacles to access.

33. The level of tariffs presents a problem in many countries, as users are generally overcharged for international calls in order to cover the low rates for domestic calls, and above all local ones. Thus we find that in countries with a telephone density of less than 20 to 30 lines per 1,000 inhabitants, receipts from international telecommunications account for more than half, sometimes as much as 70 to 80 per cent, of operating agencies' total earnings. Such heavy weighting is a disadvantage for big users of international telecommunications, such as persons active in international trade, and limit their development by adding greatly to the cost of international transactions. The solution lies in a major restructuring of tariffs, on which many developed countries have already embarked, bringing tariffs more into line with costs, by reducing the charges for international calls and increasing those for domestic calls, particularly local ones, by introducing time-based charging.

34. Another tariff obstacle is represented by the extra costs associated with certain services or uses that are particularly important for international trade. The high cost of connection in some countries limits the possibilities for small and medium-sized enterprises. The existence of specific extra charges, often recurrent and not in any way justified by the cost, for the connection of particular terminals, e.g. fax or modems, considerably handicaps the development of these essential tools of today's trade. Terminal marketing practices (rent only or purchase only) can also lead to distortions in connection operations.

35. Besides these tariff questions there are many non-tariff obstacles making for unequal access to networks and services. The need for multiple subscriptions, which may or may not be due to a multiplicity of operating agencies, the need for security deposits, or payments in foreign currency, for access to certain types of services, particularly international ones, constraints connected with collection procedures (type of address, means of payment, for example), are all factors which complicate the use of telecommunications services. On the other hand, many services can facilitate use of the networks, such as personal cards enabling the holder to charge his account calls made elsewhere (from call-boxes, from other users' telephones, from abroad, etc.), but they are not available everywhere.

36. Service quality is also an important factor in network efficiency or inefficiency. Connection waiting times are a crucial factor in many countries, where it is often necessary to wait several years, depending on the location, to get connected to the network. But delays in line clearance after a fault, delays in setting up calls, waiting for a dialling tone, dialling, routing, the call success rate (calls actually set up), the quality of calls (audibility, no cutting off in the middle, etc.) are all factors which can make telecommunications useful or useless. Finally, this list would not be

complete without a reference to practices that discriminate between users depending on their institutional or financial power, enabling them to be given priority in having lines connected or faults cleared.

37. These problems can lead Governments, communities or private economic groups to envisage setting up special access zones. These zones, sometimes known as "teleports", enable a particular economic milieu to be given access to the most advanced networks and services. They can form an intermediate stage in the development of networks and services, but can also create disparities between enterprises if access to them is confined to the actors present in a particular limited geographical area. Where such teleports do not exist or do not give satisfaction, Trade Points could play this vital role of providing special access to the networks.

3. The integrated services digital network

38. The integrated services digital network (ISDN) is a natural extension of existing telephone networks, in the sense that it offers each user a digital connection with universal standardization on the basis of the existing telephone infrastructure. This digital connection means that more services can be offered to users on the same basic network (in particular, it allows files to be transferred more quickly and can transmit pictures, making possible such services as video-phone), with a big improvement in quality and capabilities. While access to the analogue telephone network is today essential for anyone wishing to engage in international trade, it is evident that access to ISDN will also very soon be just as indispensable. The unequal access to the analogue service, however, suggests that there will be even more glaring inequality in the access to tomorrow's digital services if action is not taken promptly. In the medium term, one ought to be able to count on greater interworkability of national ISDN (Table 1).

Table 1

ISDN interconnection matrix, end 1993

from / To	Ger	Aus	Aut	Bel	Can	Den	Spa	Fin	Fra	Gre	Hkg	Ire	Ita	Jap	Lux	Nor	NZ	Net	Por	UK	Sing	Swe	Swi	USA
Germany		o	o	o	o	o	o	o	o	94	o		o	o	94	o	o	o	94	o	o	o	o	o
Australia	o			o		o	o	o	o							o	o	o		o	o	94	o	o
Austria	o			o		94			o	94		94				94		94	94	94		94	o	
Belgium	o	o	o		o	o	o	o	o	94	o	o	o	o	o	o	o	o	o	o	o	o	o	o
Canada	o			o				o	o					o		o		o	94	o			o	o
Denmark	o	o		o			o	o	o	94	o		94	o	94	o		o	94	o		o	o	o
Spain	o	o		o		o		o	o	94			o	94		o		o	94	o	o	94		o
Finland	o	o		o	o	o	o		o		o		94			o		o	94	o		94		o
France	o	o		o	o	o	o	o		95	o	o	o	o	94	o		o	94	o	o	94	o	o
Greece	o		94	94		94	94		95				o					94		o		94		
Hong Kong	o			o		o		o	o							94		o		o	o	94	o	
Ireland	o			o		94			o					o	94	94		94	94	o		94	94	o
Italy	o			o		94	o	o	o	94				o		o		o	94	o		o	o	o
Japan	o			o	o	o	94		o			o	o			o		o		o	o	94	o	o
Luxembourg	94			o		94			94			94				94		94	94	94		94	94	
Norway	o	o	94	o	o	o	o		o		94		o	o	94		o	o		o		o	o	o
New Zealand	o	o		o												o		o		o	o			
Netherlands	o	o		o	o	o	o	o	o	94	o	94	o	o	94	o	o		94	o	o	o	o	94
Portugal	94			o	94	94		94							94	o		94		o		o	o	
United Kingdom	o	o	o	o	o	o	o	o	o	94	o	o	o	o	94	o		o	o		o	o	o	o
Singapore	o	o		o			o		o		o		o	o			o	94		o			o	o
Sweden	o	94		o		o	o	o	o	94	94		o	94	94	o	o	o	o	o	o		o		94
Switzerland	o	o	o	o	o	o	o	o	o		o	94	o	o	94	o		o	o	o	o	o		o
USA	o	o		o	o	o	o	o	o			o	o	o		o		94		o	o	94	o	

Source: IDATE, Eurie'93 Handbook, annual reports.

Legend:

o = operational interconnection end 1993.
94 or 95 = scheduled interconnection date.
no entry = nothing announced by operating agencies or information not available.

4. Cellular networks

39. Cellular mobile networks today serve a twofold purpose: to provide a complete mobility function for users of voice services, and to offer an alternative to the switched telephone network in countries which have to make an immediate effort in terms of the rate of telephone penetration. Digital technologies offer the prospect, seen from the demand side, of a favourable cost-benefit ratio. The penetration of this type of service is still very unequal, however, as is shown in table 3. In addition, the interconnection problems (in particular roaming, which enables a subscriber to a network to use his terminal in the territory of other operating agencies) are far from being solved (table 2).

Table 2

International GSM roaming agreements matrix, mid-1993

To \ from	Ger	Aut	Bel	Den	Spa	Fin	Fra	Gre	HKg	Ire	Ita	Lux	Nor	Net	Por	UK	Swe	Swi
Germany		P	P	o		o	o	P		P	o	o	o	P	o	o	o	o
Austria	93																	
Belgium	93											P		P		94	P	o
Denmark	o		94			o	o	P	94	o	o	o	o	P	o	o	o	o
Spain	93		94													94		
Finland	o			o			o	P	94	o	o	P	o	P	o	o	o	o
France	o			o		o		P					o			o	o	o
Greece							93									o		
Hong Kong								P									P	
Ireland	93			o		o	93						o			o	o	
Italy	o			o		o	o						o			o	o	o
Luxembourg	o		94	o			93						o	P		93	P	o
Norway	o		94	o		o	o	P	94	o	o	P		P	o	o	o	o
Netherlands	P		94				94					P				94	P	o
Portugal	o			o		o	93						o			93	o	o
United Kingdom	o			o		o	93	o			o		o				o	o
Sweden	o			o		o	o	P		o	o	P	o	P	o	o		o
Switzerland	o		94	o		o	o	P			o	o	o	P	o	o	o	

Source: IDATE, Telececomeuropa

Legend:

0 = operational interconnection mid-1993
93 = interconnection planned end 1993
94 = interconnection planned end 1994
P = interconnection planned at unspecified date
No entry = no announcement by operating agency

Table 3

Cellular mobile telephony penetration indicators, end 1993

Country	Year put into service 1/	Number of subscribers in thousands	Penetration per 1,000 inhabitants
			over 50
Sweden	1981 and 1992	1 150	93
Finland	1986 and 1992	442	88
Norway	1981 and 1993	357	83
Iceland	1986	17	68
Denmark	1982 and 1992	285	56
United States	1983	13 070	53
			20 to 50
Singapore	1988	135	45
Canada	1985	1 165	44
Hong Kong	1984	255	44
Australia	1986	673	40
Switzerland	1987 and 1993	248	37
Faroe Island	1989	2	35
New Zealand	1987	105	31
United Kingdom	1985 and 1992	1 790	31
United Arab Emirates	1989	44	28
Austria	1984	211	27
Macao	1988	13	27
Bahrain	1986	12	24
Kuwait	1986	50	23
Taiwan	1989	450	23
Brunei	1989	5	20
Cyprus	1988	14	20
Puerto Rico	1991	72	20
			10 to 20
Germany	1985 and 1992	1 552	19

Country	Year put into service 1/	Number of subscribers in thousands	Penetration per 1,000 inhabitants
Italy	1985 and 1992	1 090	19
Malaysia	1985	285	16
Malta	1990	6	16
Andorra	1990	1	15
Ireland	1985 and 1993	53	15
Japan	1979 and 1994	1 766	14
Netherlands	1985	205	14
Israel	1986	46	10
France	1985 and 1992	550	10
			1 to 10
Republic of Korea	1984	345	8
Portugal	1989 and 1992	85	8
Belgium	1987 and 1994	65	7
Venezuela	1988	130	7
Spain	1982	242	6
Thailand	1986	352	6
Chile	1989	67	5
Mexico	1989	370	4
Mauritius	1992	3	3
Estonia	1993	2	2.6
Argentina	1989	70	2
Hungary	1990	22	2
Luxembourg	1985 and 1993	4	2
Oman	1985	4	2
Slovenia	not specified	4	2
Croatia	not specified	6	1.3
Turkey	1986	74	1.3
Saudi Arabia	1981	18	1.2
Greece	1993	12	1

Country	Year put into service 1/	Number of subscribers in thousands	Penetration per 1,000 inhabitants
Philippines	1989	73	1
			0.1 to 1
Peru	1991	20	0.9
Costa Rica	1989	2	0.7
Brazil	1990	68	0.5
South Africa	1986	14	0.4
Latvia	1993	1	0.4
Sri Lanka	1989	6	0.4
Tunisia	1985	3	0.4
China	1987	350	0.3
Guatemala	1991	3	0.3
Czechoslovakia	1992	6	0.3
Indonesia	1986	43	0.2
Morocco	1988	5	0.2
Pakistan	1990	20	0.2
Russian	1991	4	0.2
Lithuania	1993	0.3	0.1
Poland	1993	3	0.1
			under 0.1
Egypt	1987	4	0.08
Algeria	1990	2	0.07
Nigeria	1992	6	0.06
Viet Nam	1992	3	0.05
Bangladesh	1991	1	0.01

Source: IDATE, Financial Times Mobile Communications.

1/ The years given in bold type are for the opening of digital networks (GSM), the others for the opening of analogue networks (AMPS, NMT, TACS).

40. These two types of networks, ISDN and cellular radio telephony, like others, such as paging networks, are now important for the operation of enterprises wishing to develop international trade. They offer basic services, particularly the telephone service, with broader possibilities as regards access and capability, enabling every agent to remain in contact wherever he is and to transmit more and more varied messages to greater numbers of correspondents, thus making commercial dealing infinitely more efficient.

B. Inequality in relation to value-added networks and services

41. The telephone and facsimile (and also telex) are basic tools which are essential for international trade. As universal services, they are already a feature of any transaction. But for the last 15 years or so telecommunications have offered a whole range of more highly-developed services. Several levels of value added can thus be identified, transmission of computerized data via dedicated networks (X25, VSAT) would be the first; value-added services proper would be the second.

1. Importance of dedicated networks

42. There are three types of dedicated networks that should be mentioned:

(a) Specialized links, which are the first dedicated media made available to users (final or intermediate customers), represent a non-negligible part of the voice-data traffic at the international level. Current problems once again concern geographical coverage, functional extensions and tariff levels (particularly in the absence of switched networks), which are too widely unequal and hence discriminatory for users.

(b) As far as data transmission on dedicated networks - X25 networks, for which the technology is now essentially established and which can thus offer a favourable cost-benefit ratio for the customer - is concerned their use in an international context remains limited by physical criteria relating to their availability and their interconnection.

(c) International VSAT networks represent an interesting alternative because of the flexibility they introduce (light ground equipment, satellite links which do not take up too much passband, capabilities evolving towards greater interactivity). Their development in international networks, however, encounters two types of obstacles: a relative cost that is still high and regulatory constraints that are considerable, even if they are tending to diminish.

2. Value-added services

43. These correspond to the implementation of specific applications, within networks, over and above the simple transmission of information. This category generally includes voice services (freephone, audiotex, teleconference) and non-voice services (EDI, E-mail, X400 message handling systems, reservation services, authorization services, videotex).

44. Access to these services, which meet the needs of modern economies, is still very unequal (availability and cost), although they already represent opportunities for increased efficiency in international trade.

45. The capacity for inter-operation of value-added services should be an essential feature of the transaction, and more particularly of its financial component. It is still inadequate at the international level (international freephone, paging, see table 4), and such inter-operation should be a priority for suppliers of the international service.

C. Problems connected with the use of telecommunications

46. The objective constraints on wide use of the telecommunication resource - problems of access - represent a first type of inequality capable of leading to a dysfunctioning of international trade. Thus, exclusion from telecommunications may constitute a barrier to participation in international trade activity.

47. But there is another form of dysfunction arising from the unequal distribution of know-how - the problem of use. Mention should also be made of the influence that could be exercised on the actual quality of demand by the instability of industrial structures in the telecommunication sector - a sector which has been undergoing profound changes for some 10 years.

1. Inequality in users' know-how

48. In many cases the large industrial and trade organizations have already introduced extensive use of telecommunication networks and services around the world into their activities. Their size, their multinational presence and the diversity and extent of their markets lead them to take the fullest possible advantage of innovations in the world of telecommunications, even in contexts where the supply of networks and services is limited, because they can put into operation efficient private networks on basic infrastructures. Small and medium-sized enterprises, on the other hand, rarely have access to the same services and can thus be at a particular disadvantage as regards access to markets.

49. It is generally accepted that in the OECD countries large enterprises spend about twice as much on telecommunications as small and medium-sized ones (although of course some of the latter are prominent in this area). But the difference is probably much greater at the world level. In fact, a high level of expenditure is a recognition of the importance of integrating telecommunications into the process of production and trade in modern economies. This difference then gives rise to unequal development of knowledge of telecommunications, i.e. how to profit from telecommunications in micro-economic value-added chains. This spiral (excellence on one side, handicap on the other) hinders the expansion of international trade in two ways. Quantitatively, it tends to exclude enterprises that are not abreast of current trends; qualitatively, it creates areas of friction between enterprises that are well equipped with telecommunication facilities and those that are not.

Table 4

X400, public services interconnection matrix, end 1993

	AUT	BEL	BGR	CHE	DEU	DNK	ESP	FIN	FRA	GBR	HUN	IRL	ISL	ITA	NOR	PRT	SWE	USA
ARE		●		●	●	●		●		●				●	●			●
ARG				●	●													
AUS	●	●		●	●	●	●			●	●			●	●			●
AUT	X	●	●	●	●	●	●	●	●	●	●	●		●	●		?	●
BEL	●	X		●	●	●	●	●	●	●				●	●	●	●	●
BGR	●		X	●	●	●		●										
BRA	●	●		●	●		●			●				●		●		●
CAN				●	●									●				●
CHE	●	●	●		●	●	●	●	●	●	●	●		●	●	●	●	●
CHL					●	●				●				●				●
CHN					●													
CRI																		?
DEU	●	●	●	●	X	●	●	●	●	●		●	●	●	●	●	●	●
DNK	●	●	●	●	●	X	●	●	●	●		●	●	●	●	●	●	●
ESP	●	●		●	●	●	X	●	●					●	●	●		●
FIN	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	●	●
FRA	●	●		●	●	●	●	●	X			●		●	●	?	●	●
GBR	●	●		●	●	●	?	●		X				●	●		●	●
HKG	●			●	●	●		●		●				●	●			
HUN	●			●	●	?		●			X			●				
IND				●	●												●	●
IRL	●	?		●	●	●	?	?	●			?			●	?		●
ISL		?			●	●		●					X		●	●		?
ISR				●	●			●										
ITA	●	●		●	●	●	●	●	●	●	●			X	●	●		●
JPN	●	●	●	●	●	●	●	●	●	●				●	●			●
KOR	●			●	●	●		●	●					●				●
MEX					●													
MYS				●		●				●				●	●			
NOR	●	●		●	●	●	●	●	●	●	?	●	●	●	X	●	?	●
NZL																		●
POL					●													
PRT		●		●	●	●	●	●					●	●	●	X		●
ROM	●																	
SGP		●		●	●	●									●			●
SWE		●		●	●	●	?	●	●	●							X	●
THA					●													
TWN					●									●				●
USA	●	●	●	●	●	●	●	●	●	●	●	●		●	●	●	●	X
ZAF		●		●	●	●										●		

Source: IDATE, EEMA.

LEGEND:
ARE: United Arab Emirates; ARG: Argentina; AUS: Australia; AUT: Austria;
BEL: Belgium; BGR: Bulgaria; BRA: Brazil; CAN: Canada; CHE: Switzerland;
CHL: Chile; CHN: China; CRI: Costa Rica; DEU: Germany; DNK: Denmark;
ESP: Spain; FIN: Finland; FRA: France; GBR: United Kingdom;
HKG: Hong Kong; HUN: Hungary; IND: India; IRL: Ireland; ISL: Iceland;
ISR: Israel; ITA: Italy; JPN: Japan; KOR: Republic of Korea; MEX: Mexico;
MYS: Malasia; NOR: Norway; NZL: New Zealand; POL: Poland; PRT: Portugal;
ROM: Romania; SGP: Singapore; SWE: Sweden; THA: Thailand; TWN: Taiwan;
USA: United States; ZAF: South Africa.

50. These dysfunctions should therefore be remedied. There is even a reasonable hope that, by means of targeted policies, one might set in motion a "virtuous circle", encouraging a levelling up of all potential international trade partners (which would by definition be dynamic).

2. Specificity of industrial structures

51. For some 10 years or so the telecommunication sector has been beset by instability, owing to the evolution of its own technological and regulatory environment. This feature is seen by those active in the economic field as a difficulty in the specification of their telecommunication requirements and in the establishment of contractual relations with suppliers of telecommunication services.

52. The introduction of the competitive element, in a context of technological innovation, has certainly resulted in a relative decline in the price of international telephone calls. But it has also speeded up the rate of introduction of new services, creating effects of competition between services and making purchase and use more problematical. By also breaking with a form of international solidarity which was still symbolized at the beginning of the 1980s by ITU (in particular by focusing the large operating agencies on conquering the market of the 600 major multinationals, while protecting themselves against attempts to cream off their own national markets), this competitive trend downgraded universal service, the industry's watchword.

D. Distortions due to government policies

53. The telecommunication sector has been undergoing an unprecedented transformation for some 10 years now. At the beginning of the 1980s, the dismantling of AT&T in the United States, the privatization of British Telecom and NTT and the opening-up of certain networks and services to competition set off a profound international reorganization of the sector, which is far from finished. This development is taking place against a background of major technological changes which, through the general digitization of information of all kinds, are producing a rapid convergence among different sectors, together with an explosion in the range of services offered. The general tendency is for States to withdraw progressively from the telecommunication sector, in three different ways:

(a) Operational withdrawal, with the creation of independent agencies to operate networks and services, the State retaining only regulatory functions, clearly distinguished from operational ones;

(b) Financial withdrawal, with ever greater recourse to private sources to finance network development, or indeed to privatization of public operating agencies;

(c) Political withdrawal, with progressive abandonment of a specific telecommunication policy, enabling individual lines of action to be pursued in terms of physical planning, employment, industrial policy and research and development.

54. The relative deregulation of the telecommunication sector that results is reflected in particular in the opening-up of certain networks and services to competition. Mobile networks (paging and cellular radio-telephony in particular), data transmission networks, cable distribution networks, satellite networks and phone card call boxes are among the first networks to have been opened up to competition. But many countries retain a monopoly of certain networks or services.

55. These liberal trends come up against many constraints, among them the major role that telecommunications can play in financing public budgets. Telecommunications are often subjected to high taxes on the various tariff components, particularly calls, and direct or indirect levies (financing of public expenditure) can weigh heavily on their capacity for self-financing. Uncertainty about government attitudes, the substantial variations that can occur in telecommunication taxes (in some countries, variations of more than 100 per cent in the taxes on calls have been recorded, seriously affecting consumption), and government levies are all factors preventing the development of uses, either directly, because of high elasticities, or indirectly, through operating agencies' ability to invest.

56. In a sector which is of macro-economic size, State intervention cannot be wholly absent. The high degree of solvency of this sector should not obscure the fact that it is an infrastructural sector of prime importance for economic development and that any wrong headed policy of government levies can only reduce its contribution to the country's economic development, and particularly to the development of trade flows, both internal and external.

III. Measures applicable to telecommunications to promote efficiency in international trade

57. A number of measures are needed in order to remedy the inequalities that exist and deal with the difficulties of access to, and use of, telecommunication networks and services. They can be divided into two categories:

(a) Structural measures applying in general to telecommunication networks and services;

(b) Specific measures creating special conditions of access to networks and services on the basis of individual infrastructures.

58. Measures in the latter category have to be assessed in the context of the Trade Point programme. Launched by UNCTAD at the Cartagena Conference in February 1992, the trade efficiency initiative has as its main aim the opening-up of international trade to newcomers. Since then the implementation of the policy has been reflected in the setting-up of Trade Points, which is a matter for local initiatives and authorities.

59. In its basic configuration, each Trade Point needs to have one or more accesses to the switched telephone network and to be equipped with a fax and a comms PC, enabling it in particular to operate an E-mail access of the internet type. This configuration, which is kept to a minimum in order not to create barriers to entry, does not prejudge the nature of the actual

communication applications that will be maintained by the Trade Point once it gets going. The nature of the medium-term needs will make it possible to identify the "telecommunication" decisions to be taken immediately, in the light of implementation problems and periods. It will also make it possible to anticipate the gains in efficiency to be expected (transaction-facilitating aspect) and their impact on the development of network terminating points (strategic resource aspect).

60. The measures proposed below are classified in two groups, those relating to access to networks and those relating to access to services.

A. Measures relating to access to telecommunication networks

61. The first measures to be considered relate to network access: these are measures concerning infrastructures and often entail investment whose impact can only be gradual. This involves raising networks to a level of geographical and functional development and offering an attractive range of tariffs which can meet the needs of small and medium-sized enterprises wishing to develop international activity. The following measures are to be considered:

(a) Complete automation of networks or procedure for connection of business users to automatic exchanges;

(b) Digitization of subscriber switches and offer of supplementary services;

(c) Development of network access in remote or low-density regions for small business users through the adoption of appropriate network architectures (small rural exchanges, TDMA systems, cellular systems, point-to-point, wire or radio-relay links, satellite transmission); the development of alternative solutions for ensuring general access to international networks (such as access to future low-orbit satellite networks);

(d) Creation, development and decentralization of access ports to X25 networks;

(e) Granting of VSAT licences on a competitive basis; recognition of licences granted among neighbouring countries or countries belonging to regional economic organizations so as to develop broader economic bases;

(f) Liberalization of terminal connection;

(g) Introduction of reciprocal terminal approval procedures (among countries belonging, for example, to the same economic organizations);

(h) Decentralization of international transit centres so as to offer international connections which do not necessarily depend on the state of the trunk networks.

62. Measures relating to telecommunication network tariffs include:

(a) Measures based essentially on tariff restructuring to reduce the differentials between residential and business users and eliminating discrimination in international calls;

(b) Reduction in the cost of international calls, with the aim of standardizing international tariffs on the basis of the current average world prices;

(c) Abolition of special subscriptions for international services; introduction of general automatic access to international services without discrimination;

(d) Introduction of peak and off-peak rates in the international service, leading to partial reductions in tariffs;

(e) Reduction in network connection costs;

(f) Abolition of discrimination by type of user;

(g) Abolition of connection costs for specific terminals (fax, modems, etc.).

63. Measures leading to an overall reduction of tariffs and greater capacity for financing network development include:

(a) Limitation of State levies on telecommunication operating agencies' income (in per cent of profits);

(b) Limitation of taxes imposed on various tariff components of telecommunications.

64. Measures relating to non-tariff obstacles are:

(a) Abolition of specific arrangements for access to international networks and services through general standardization of procedures for commercial interconnection between domestic and international operating agencies;

(b) Access to network and service directories, both domestically and internationally;

(c) Provision of quality services, in terms of both connection waiting times and call quality;

(d) Provision of administrative information enabling call costs to be monitored and checked (detailed billing, service for monitoring and setting a limit on call expenditure, etc.).

B. Measures relating to access to services

65. These measures are designed to increase the number of services available in a country and to spread their use through appropriate development of a

supply adapted to users' specific expectations, particularly for international trade. These measures are based on liberalization of telecommunication services. They include:

(a) Access to international data transmission services (Infonet, Sita, etc.) and access to international message services (Internet); possible development of a network of intermediaries to market these services. A specific role could be entrusted to Trade Points, which might negotiate with some of the networks not just on access to different types of connection, but also on preferential tariffs, taking account, for example, of existing overcapacity or opportunities for marginal cost charging in such a way as to reduce appreciably the cost of the international data transmissions which are essential for international trade;

(b) Opening up of basic services to competition (e.g. X400 message handling systems) and development of competition with regard to value-added services, possibly on a regional basis, with regulation of access switchboards;

(c) Establishment of service interconnections, particularly interfaces between telex, data-transmission services and fax;

(d) Establishment of "kiosk" mechanisms based on national or international networks;

(e) Introduction of "one-stop shopping" for access to communication services, possibly combined with access to information services. "Kiosk" mechanisms and "one-stop shopping" functions could be entrusted initially to Trade Points, which would be responsible for introducing them;

(f) Possibility of paying for international services in local currency;

(g) Development of international roaming agreements for all types of mobile services (paging, radio-telephony, etc.);

(h) Certification of international services meeting openness criteria, in terms of standards and non-discrimination against users;

(i) When the provision of services seems inadequate in a particular area, improvement of the opportunities for persons involved in international trade to negotiate access to services provided from outside locations; this could in particular be brought about through Trade Points.

(j) Progressive decentralization of special access (of the teleport or Trade-Point type) in virtual form within countries;

(k) Preparation of specifications for all the communication applications described.

66. The specifications mentioned in paragraph 65 (k) above should:

(a) Be based on a breakdown of the application requirements. These communication requirements should be determined in relation to the following

goals: access to market information; knowledge of international trade procedures; contacting of partners in the transaction; actual carrying-out of the transaction, including payment; need to check or file the trade relation; consolidation of particulars of the deal;

(b) Specify in terms of minimum requirements the conditions for the supply of telecommunication services and networks. To this end a table should be prepared showing the functional correspondences between application requirements and services available;

(c) Raise all immediate problems with regard to regulations. Particular attention should be given to the problem of extraterritoriality of services in cases where the local supply is inadequate;

(d) Analyse the organizational problems involved in the implementation of telecommunication services. Particular stress should be laid on the problems of adaptation in the use of telecommunication resources (establishment of (distance) training facilities for telecommunications). The problems of managing telecommunication resources (out-sourcing) will also be described.

(e) Specify the cost-benefit ratio in the introduction of services. This should be a simple economic calculation based on the costs of service access and use in relation to the expected benefits (limitation of dysfunctions in transactions, improvement of productivity in the processing of deals, value added from the standpoint of the organization of export markets);

(f) Lead to the development of a political management tool.

67. If there is, in the long term, a network effect in the making of contact between Trade Points (TP), it will be only one element in the network of relations that the TP will maintain with the overall economic environment. From the standpoint of communication flows, a distinction should be made between national traffic (TP-inside the country), regional traffic (TP-another country in the same economic zone, e.g. European Union), inter-TP traffic (effective network set up by interconnection of TPs) and international traffic proper. The distribution of these flows will be a fundamental guideline for a total communication policy specific to TPs.

68. It would thus be possible to draw up a matrix of communication flows, with a view to discussion and negotiation (on specific tariff terms, for example), bringing out the two dimensions of the telecommunication resource in relation to the requirements of international trade: facilitation and strategic resource.

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DRAFT GUIDELINES ON KEY SECTORS FOR TRADE EFFICIENCY

TELECOMMUNICATIONS

**Document prepared by the UNCTAD secretariat
on the basis of a study by consultants**

Corrigendum

Table 3, page 17: first column of table heading should read:
Country/territory

Table 4, page 22: in Legend, after Taiwan, add:
, Province of China

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